NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

RESIDUE MANAGEMENT, MULCH TILL
(Acre)
CODE 329B

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round, while growing crops where the entire field surface is tilled prior to planting.

PURPOSES

This practice may be applied as part of a conservation system to support one or more of the following:

- Reduce soil erosion.
- Reduce wind erosion.
- Reduce irrigation-induced erosion.
- Improve or maintain water quality.
- Improve or maintain water infiltration.
- Maintain or improve soil organic matter content and tilth.
- Manage snow to increase plant available moisture.
- Provide food and escape cover for wildlife.
- Maintain and improve agronomic yields.

CONDITIONS WHERE PRACTICE APPLIES

This practice shall be a component part of a Resource Management System (RMS) which meets erosion quality criteria.

This practice applies to all cropland and other land where crops are grown. It includes tillage methods commonly referred to as mulch tillage, minimum tillage, or conservation tillage. It applies to tillage operations on all cropland where full width tillage implements are used to prepare the seedbed for the following crop. Full width tillage implements are those that disturb more than 66% of the soil surface.

CRITERIA

A nutrient and/or pest management plan shall be prepared if required by the Quality Criteria for Water.

Current erosion, sediment, and/or residue prediction technology such as Revised Universal Soil Loss Equation (RUSLE), Wind Erosion Equation (WEQ), Surface Irrigation Soil Loss Model (SISL), will be used to evaluate acceptable crop rotations, tillage sequences residue orientation and erosion rates of the evaluated practices or systems.

Evaluations will include appropriate support practices to achieve the desired level of treatment, or for a Resource Management System (RMS).

A Soil Condition Indices Rating of 0 or greater as determined using the Soil Conditioning Indices. Crops within the rotation shall be grown in a planned, recurring sequence. Note exceptions as outlined in the Operations and Maintenance Section.

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T) or other planned soil loss objective shall be determined using current approved erosion prediction technology cited above.

Burning of crop residues are not allowed except as noted. Burning crop residues is acceptable only when pest populations exceed allowable densities as established by the University Of Idaho and other Integrated Pest Management options have been exhausted.

Residue removal by burning will not be performed without full evaluation of impacts on soil, water, animal, plants, and air. Reference ID-ECS-001.

Residue can be burned-only if the field(s) to be burned is to be immediately reseeded to a sod or cover crop.

Minimum residue requirements following a low residue crop or management system within an acceptable rotation are required as follows:

- Following summer fallow or low residue crops, a minimum of 20% residue is required when entering the critical erosion period.
- On furrow irrigated cropland, 20% residue or an appropriate erosion technology, (PAM, surge irrigation, Irrigation Water Management, etc.) shall be a component of the planned system.

Tillage implements shall be equipped to operate through plant residues, maintaining residue on or near the soil surface by undercutting or shallow mixing.

Planters, drills, or air seeders shall be equipped to plant in residue distributed on the soil surface or mixed in the tillage layer. The number, sequence, and timing of tillage and planting operations and selection of implements shall be designed and managed to achieve the planned amount, distribution, and orientation of residue after planting, through critical erosion periods, or other time periods (i.e., seasonal high intensity storms).

Residue evaluations shall be documented using approved specification sheets, job sheets, worksheets, or other acceptable documentation. Adjustments to the planned tillage scenario shall be made as needed based on field measurement of remaining residue.

Tillage operations shall be limited to methods that leave residue on the surface and maintain the planned cover conditions.

Increased residue levels may affect soil water holding characteristics. Residue shall be evenly distributed and maintained on the soil surface. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed as determined by evaluation using approved prediction technology.

Where soil moisture conservation is a concern, manage stubble to trap snow or winter precipitation by leaving stubble standing at least 6 inches high following harvest. Stubble shall be maintained in a standing orientation over winter to trap and retain snow.

Fall tillage operations to manage snow or winter moisture shall be limited to undercutting tools such as blades, sweeps, or deep tillage implements such as rippers or subsoilers, in order to maintain stubble in a standing condition.

Loose residue to be retained on the field shall be uniformly distributed on the soil surface to reduce variations in nutrient release, immobilization and soil and water characteristics.

The amount and height of stubble of residue needed to provide food and escape cover for wildlife shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless it is determined by the Wildlife Habitat Evaluation Guide procedure that removal would not adversely affect habitat values. Stubble shall be left standing over winter. Tillage shall be delayed until spring, in order to maintain waste grain on the soil surface during winter.

CONSIDERATIONS

Individual conservation practices should be planned as part of a comprehensive conservation plan which addresses all resource concerns on the unit and reaches a RMS level of treatment.

Where water quality is a concern, a buffer or filter strip should be placed between where the practice is applied and the water resource.

Production of adequate amounts of crop residue necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacing.

Where improvement of soil tilth is a concern, use of undercutting tools will enhance accumulation of organic material in the surface layer.

The effectiveness of stubble to trap snow increases with stubble height. Variable height stubble patterns may be created to further increase snow storage or increased storage in specified locations. The value of residues for wildlife habitat can be enhanced by leaving rows of unharvested crop standing at intervals across the field.

Increased crop residues on or near the soil surface may result in reduced nutrient availability to plants. Effectiveness of surface applied pesticides may also be reduced in some cases. For these reasons, consideration should be given to the development of nutrient and pesticide management plans. Residues trap sediment and reduce the amount carried to surface water. Crop residues promote soil aggregation and improve soil tilth.

Where surface water quality concerns remain after application of this practice, consideration should be given to the addition of other sediment retention practices.

Application of animal waste which includes bedding or waste feed can be considered part of the minimum residue requirements. Manure application rates should be balanced with fertilizer applications as a part of a nutrient management plan.

PLANS AND SPECIFICATIONS

Site specific specifications are developed by the planner for each land unit being planned. Site specific specifications are developed using current prediction and/or evaluation tools, i.e.: RUSLE, WEQ, Surface Irrigation Soil Loss (SISL) model, Soil Condition Index Rating, etc.

Specifications include print outs from prediction tools, related worksheets, job sheets, or other acceptable documentation.

OPERATION AND MAINTENANCE

Annual maintenance of this practice may be required by certain program or contractual agreements.